was supereminently qualified for the laborious and important work in which he had for a long series of years been engaged, of giving an English version of the venerable literary remains of sacred antiquity, the scriptures of the Old and New Testament. This was the work and the labour of his life—the object which he ever kept in view, and the pursuit from which he never deviated, but at short intervals, to relax and and unbend his mind by lighter occupations, and studies less severe; but still returning to his proper and favourite occupation with greater relish and delight. During his life, this undertaking did not meet with encouragement adequate to the magnitude of the design; or, it may be added, to the merit of the execution. In this last respect, it will be matter of surprize to all who are competent to judge of the nature of such an enterprize, how much has been done, and with what uncommon ability and success. It every where displays the skilful hand of a master. Some few exceptionable passages might perhaps be pointed out. But, is it not matter to be wondered at, that a greater number has not occurred? Had no defects appeared, then indeed the world might have seen, what it has no right to expect—what is not the privilege of human nature to produce; and what the translator never had the arrogance to propose—a perfect work. Some verbal alterations might, even in the opinion of Dr. Geddes' most ardent friends, have been made with advantage.*

But, here, so pertinent and just is the sentiment of that great master of the art of criticism, whose works he always read with delight and enthusiasm, that the application cannot be resisted:

Ubi plurima nitent——non ego paucis
Offendar maculis, quas aut incuria fudit,
Aut humana parum cavit natura.

Had this great work been brought to a conclusion, with the same ability with which the venerable translator had begun it, it might justly have been considered as an honour to the country, and the glory of the age in which he lived. However it may be regarded by the narrow-minded and the illiterate, it will be the subject of lasting and sincere regret to all the enlightened friends of free inquiry—of biblical learning and sacred criticism, that the work is now left in an unfinished and imperfect state, by the death of the incomparable author. And this event must continue to be still more deeply regretted if, as there is reason to fear, the loss be irreparable; if there be no possibility of finding another person capable of carrying on the same design, and of following with equal steps in the same virtuous and honorable career, so generally competent, so highly accomplished, so variously and so amply furnished, for executing this grand desideratum of the learned and the christian world."

* The confession which the translator himself has made upon this subject, reflects great honour on the candour and liberality of his mind. Those therefore, who object, should do him the justice to examine his note on Exod, 12 11. After a learned and curious disquisition on the meaning of the term *Passover*, and remarking that it does not express the meaning of the original word, he adds, "it would have been better, perhaps, to retain the Hebrew word, as most of the ancients, and several moderns, have done;" and afterwards, "To put a short end to this controversy, let *Phasah* be restored in my Version throughout the first volume, as it has been done throughout the second, and let the reader affix to it what meaning he pleases." See critical remarks, p. 210.

DISCOVERIES AND IMPROVEMENTS IN ART'S MANUFACTURES, &c.

Patent of Mr. Thomas Mead of Sculcoates, Yorkshire, for a Rotative Steam Engine, Dated August 1808.

THE part of this engine, in which the pistons operate, consists of a hollow ring (sufficiently large to contain them in its transverse direction) in whose internal diameter is placed a hollow disk, which communicates with the cavity of the ring all round.

The figure of this part of the engine will also be produced by causing a circle, to whose side a narrow parallelogram is attached in the direction of one of the radii, to revolve round the farther extremity of the parallelogram at right angles to its plane.

This containing part or barrel, of the engine is divided in the direction of the plane of the disk, so that each half consists of a flat plate and an open cavity containing half the ring, which is furnished with a flat flanch all round, for uniting it to its corresponding part.

Within the hollow ring two pistons work at right angles to its plane, one of which is joined to a solid axle (which passes through the center of the hollow disk) by a flat circular plate of the same diameter of the disk, and the other is united to a hollow axis, or tube (which surrounds one half lengthways of the solid axis) by a flat circular plate similar to the other.

At the inside of each surface or plate, of the hollow disk, is a cavity all round, in which is placed a ring at the bottom, while the rest of the cavity is stuffed with oakum. Screws pass through the plates of the disk, so as to press against this ring, by whose action it is forced against the plates which connect the pistons with the axis, so as to prevent the passage of steam in that direction. Each plate of the hollow disk is also furnished with a short projecting pipe, or hollow boss, at its center, for the better passage of the axles through it.

The solid axle, and the hollow axle which surrounds it, has each a crank attached to it, at whose extremity is placed a friction wheel, whose plane is at right angles to the direction of the axle. These friction wheels work in a groove that runs across the face of the fly wheel in the direction of its diameter; for which purpose the fly wheel is placed so that its plane is at right angles to the axles to which the pistons are fastened, while its center is fixed at such a distance from the said axles, that the middle point of the friction wheel, at the extremity of its crank, may reach a little way beyond this center.

Two holes are made in one of the portions of the hollow ring, near the circumference, and about a tenth of it, or 36 degrees from each other;—from one of which a pipe passes to the boiler to convey the steam, and from the other, another pipe extends to the condenser.

When all the machine is put together, the fly wheel is in a vertical position, as usual; the plane of the hollow ring parallel to it, and the axis of the pistons at right angles to its surface.

On account of the position of the friction wheels in the groove of the fly wheel, and the machinery to which they are attached; if the fly wheel is turned round, each friction wheel will alternately move from the center of the fly wheel to its circumference and back again at each revolution; and of course the speed with which they will be carried round, will alternately pass from a maximum to a minimum, and while close to the center, will experience scarcely any motion forwards; but when near the circumference will move as quick round as that part of the fly, and the two pistons, from their connection with them, will be carried round with a similar varying velocity, which will in each piston, through the greatest part of its course be the reverse of that of the other, for while one piston is nearly motionless, the other will be moving round with its greatest velocity.

It is on this last circumstance that the motion of the engine depends, for each piston being thus alternately rendered nearly motionless (by its connection with the fly) serves as a fixed basis, against which the expansion of the steam may re-act to force the other piston forward, and the passages to the steam and the condenser being placed facing the arbor of the fly, one of the pistons will remain in the space between them, for the greatest part of each revolution, and will not pass by one of these passages, till the other piston, forced round in the opposite direction, will have passed the other, and of course have entered the space between them, from which the first is about to depart.

The edges of the pistons are grooved all around, for the better holding of the packing, and all the parts which work in contact are ground so as to work true and fairly and be impervious to the steam.

A current of water, of air, or of gas, may work this engine in a similar manner to the steam. And if its action is reversed, by applying a power to turn the fly wheel, it may be used as an engine to force water upwards, for extinguishing fires, or for other purposes. It may be also used for an air pump in the same manner, either for philosophical purposes, or for the condenser of a steam engine.

A method is described by the patentee of making the engine work with two solid axles, instead of with a solid and a hollow one. He has also recounted some other forms for the barrel of the engine, by which the same motions may be produced, but the combination above related, seem much superior to those variations.

The Patenteestates that he has established a manufactory of these engines at Hull, under the firm of Mead, Penrose and Co. and states that he can make them cheaper, and far less complicated, than any other steam engines hitherto erected, with superior performance; and at least equal to any that *may be made hereafter*.

Remarks...Particular pains have been taken to describe this curious engine as accurately as possible; but such is the difficulty of doing this without a plate, that the writer almost despairs of conveying an adequate idea of it, notwithstanding his best endeavours to do so, and would not have attempted it, but for its very singular formation. Those who wish to see a plate of it, will find one in the Repertory of Arts, No. 91, and even with this asssistance the specification in that work will require some study to understand it, though very fairly and properly drawn up.

Mr. Mead's revolving steam engine, is certainly one of the most ingenious combinations of mechanism, that has been brought before the public for some time, and on this account does great credit both to the mechanical knowledge, and inventive powers of its author. It is also superior in the contrivances for making its several parts impervious to steam, and to wear truly and fairly, to any rotary engine as yet described in print. It is besides simpler than most repercussive, or alternating, engines from requiring no beam, no valves, and of course none of the complicated apparatus used for these parts. On the other hand it is necessary to state that it is defective in the principal point, in which rotative engines are designed to be superior to the repercussive kind in common use.—In the common engines there must be a loss of momentum at every change of direction of the motion of the piston, and as loss of momentum is loss of power, and that a loss of expence, a good rotative engine has been always a desideratum, from the idea that in it there would be no loss of momentum. Now in Mr. Mead's engine the two pistons, and the parts connected with them, alternately stop still, for some time in each revolution, and at such time must lose all their momentum; wherefore in this point, this rotative engine is in no respect better than a common repercussive one.

As to its working without a beam, many of the latter sort are now made to do so also; and the system of the valves has been reduced to such great simplicity and cheapness by the inventions of Mr. J. Dickson (for which he has obtained a patent, which is described in the Athenæum, vol. 4. p. 255) that very little more can be saved now on this point.

The difficulty of packing the pistons, &c. of Mr. Mead's engine, remains an objection against it, as well as against all the rotative engines yet brought before the public; and although it is much superior to most of them in this respect, still the whole of it must be taken asunder every time the packing requires to be renewed, which is a considerable inconvenience.

In using this machine as a pump for raising water, it will be necessary that the arms of the cranks should extend farther beyond the arbor of

the fly, than when it is used as a steam engine; for if this is not done, when the groove of the fly comes to a position at right angles to a line drawn from its arbor to the axle of the engine, it will act on the crank which is before its line of motion, in such a very acute angle as to risk breaking, or displacing the axle, or itself.

This engine has no advantage over a common pump in raising water, because its pistons coming to a state of rest in each revolution, as effectually stop the momentum of the water as the alternating motion of the pump does, and there will be as much time lost in the slow part of this revolution as in the descent of the pump rod; but if by a variation in the mode of moving the cranks, each piston was made to move round alternately with a uniform velocity, while the other was at rest, then the water would be raised in a continued flow, without any loss of momentum, and the engine would be much superior to the common pump in its effects. This improvement most probably could easily be effected by the ingenious inventor.

It seems very doubtful, when the nicer workmanship of several parts requisite for Mr. Mead's engine is considered, whether he could sell those of equal powers to common steam engines for a less price, as he asserts. But this can be only determined when he publishes his prices. But let this be as it will, however Mr. Mead may exalt the merits of his engine, above all yet erected, it certainly is bordering on the presumptive, if not entirely within its limits, to declare as he has done, that no steam engine will *ever* be made superior to his. This the writer has the best reasons for denying, exclusive of the impossibility of Mr. Mead's having been able to dive into the fathomless abyss of futurity, and bring up with him an account of all possible contingencies on any subject whatsoever. The great ingenuity of the contrivance may however very well excuse this little ebullition of vanity in the inventor of this singular rotative steam engine, which from the very curious combination of its parts must give pleasure to all amateurs of mechanism.

Patent of Mr. Richard Trevethick of Rotherhithe, Engineer, and of Mr. Robert Dickinson, for a method of stowing Ships, by packages (cases) of a kind not hitherto employed, for containing goods. Dated October 1808.

Instead of the casks, chests, and various other receptacles (for containing goods, provisions, or liquors, for transportation) which are usually made of wood, the specification of this patent, proposes the introduction of iron cases, "made by casting, forging, laminating and rivetting together plates of this metal, with covers capable of being secured to them by bolts, screws, or by other means, and so as to render them impenetrable to the external air and moisture."

These iron cases are mostly made in the form of rectangular or hexagonal prisms, to prevent the waste of stowage which cylindric shapes occasion, which are never used for them, but when economy of space is not requisite.

In these iron cases it is asserted that water, oil, and various other fluids, as well as provisions of different kinds, will be better preserved from waste, putrescency, leakage, and the depredations of vermin, than in wooden vessels; and for the purposes where it is expedient, these iron cases, are tinned on the inside, or coated with a varnish, suited to the articles they are destined to contain.

In a pamphlet published by the patentees, on the advantages of their iron cases, or casks, a calculation is inserted, by which it appears, that the difference of space occupied by a ton butt of wood, and one of the iron vessels, containing an equal quantity, would be 160 gallons. A wooden water cask of this size, or containing 250 gallons, is an inch and a half thick, and has 57 gallons of solid wood, and loses at the chimes at each end 14 gallons more; making in all 71 gallons loss. But an iron cask, containing the same quantity being only three sixteenths of an inch thick, has but 7 gallons of solid iron, and having no chimes, gives an advantage of 64 gallons; besides this, the space lost between the wooden cask and those